as the amount of the fluorochemical surfactant increases.

5/7. The chemically amplified positive working resist composition of claim 6 wherein said fluorochemical surfactant is of the formula (1):

$$Rf\text{-}[(CH_2)_aO]_m\text{-}CH_2CHR^1CH_2O\text{-}(CH_2CHR^2O)_n\text{-}CH_2CHR^1CH_2\text{-}[O(CH_2)_a]_m\text{-}Rf' \quad (1)$$

wherein R^1 is hydrogen, a hydroxyl group, a straight, branched or cyclic alkoxy group of 1 to 6 carbon atoms, or an alkylcarbonyloxy group whose alkyl moiety has 1 to 6 carbon atoms, R^2 is hydrogen or a straight, branched or cyclic alkyl group of 1 to 6 carbon atoms, a is a positive integer of 0 to 6, m is equal to 0 or 1, and n is a positive integer of 1 to 40, each of Rf and Rf', which may be the same or different, is a straight, branched or cyclic fluoroalkyl group having 1 to 12 carbon atoms, wherein all groups attached to its carbon atoms are fluorine atoms or some are fluorine atoms and the remainder are hydrogen atoms.

A1 cnt

~~8.~~ A chemically amplified negative working resist composition comprising:

an alkali-soluble resin;

a crosslinking agent having a group reactive with the alkali-soluble resin in an acidic condition;

a photo-acid generator capable of generating acid upon exposure to deep UV, X-rays or electron beams; and

a fluorochemical surfactant functioning to reduce the contact angle at the interface between the surface of the resist composition coated onto a substrate and water or an aqueous base developer as the amount of the fluorochemical surfactant increases.

~~9.~~ The chemically amplified negative working resist composition of claim 8 wherein said fluorochemical surfactant is of the formula (1):

$$Rf\text{-}[(CH_2)_aO]_m\text{-}CH_2CHR^1CH_2O\text{-}(CH_2CHR^2O)_n\text{-}CH_2CHR^1CH_2\text{-}[O(CH_2)_a]_m\text{-}Rf' \quad (1)$$

wherein R^1 is hydrogen, a hydroxyl group, a straight, branched or cyclic alkoxy group of 1 to 6 carbon atoms, or an alkylcarbonyloxy group whose alkyl moiety has 1 to 6 carbon atoms, R^2 is hydrogen or a straight, branched or cyclic alkyl group of 1 to 6 carbon atoms, a is a positive integer of 0 to 6, m is equal to 0 or 1, and n is a positive integer of 1 to 40, each of Rf and Rf', which may be the same or different, is a straight, branched or cyclic fluoroalkyl group having 1 to 12 carbon atoms, wherein all groups attached to its carbon atoms are fluorine atoms or some are fluorine atoms and the remainder are hydrogen atoms.

6 ~~10.~~ A resist composition for g-line or i-line comprising:

a novolak resin;

a naphtoquinonediazide compound; and

a fluorochemical surfactant functioning to reduce the contact angle at the interface between the surface of the resist composition coated onto a substrate and water or an aqueous base developer as the amount of the fluorochemical surfactant increases.

A1 Cont

7 ~~11.~~ The resist composition of claim 10 wherein said fluorochemical surfactant is of the formula (1):

$$Rf\text{-}[(CH_2)_aO]_m\text{-}CH_2CHR^1CH_2O\text{-}(CH_2CHR^2O)_n\text{-}CH_2CHR^1CH_2\text{-}[O(CH_2)_a]_m\text{-}Rf' \quad (1)$$

wherein R^1 is hydrogen, a hydroxyl group, a straight, branched or cyclic alkoxy group of 1 to 6 carbon atoms, or an alkylcarbonyloxy group whose alkyl moiety has 1 to 6 carbon atoms, R^2 is hydrogen or a straight, branched or cyclic alkyl group of 1 to 6 carbon atoms, a is a positive integer of 0 to 6, m is equal to 0 or 1, and n is a positive integer of 1 to 40, each of Rf and Rf', which may be the same or different, is a straight, branched or cyclic fluoroalkyl group having 1 to 12 carbon atoms, wherein all groups attached to its carbon atoms are fluorine atoms or some are fluorine atoms and the remainder are hydrogen atoms.

8 ~~12.~~ The resist composition of claim 2 wherein R^1 is a hydroxyl, methoxy or acetoxy.

9 ~~13.~~ The resist composition of claim 2 wherein R^2 a hydrogen or methyl.

10 ~~14.~~ The resist composition of claim 2 wherein a is a positive integer of 0 to 2.

11 ~~15.~~ The resist composition of claim 2 wherein n is a positive integer of 2 to 8.

12 ~~16.~~ The resist composition of claim 2 wherein Rf and Rf' are, independently, perfluorobutyl, perfluorohexyl, perfluorooctyl, perfluorodecyl, perfluoro-3-methylbutyl, perfluoro-5-methylhexyl, perfluoro-7-methyloctyl, perfluoro-9-methyldecyl, 2H-tetrafluoroethyl, 4H-octafluorobutyl, 6H-dodecafluorohexyl, or 8H-hexadecafluorooctyl.

13 ~~17.~~ The resist composition of claim 1 wherein the fluorochemical surfactant is blended in the resist composition in an amount of 10 to 2,000 parts by weight per million parts by weight of the composition.

A1 cont

14 ~~18.~~ The resist composition of claim 1 wherein the fluorochemical surfactant is blended in the resist composition in an amount of 50 to 700 parts by weight per million parts by weight of the composition.

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sub B2 ~~19.~~ The resist composition of claim 5 wherein the base polymer is polyhydroxystyrene, poly[(t-butyl acrylate)-(hydroxystyrene)] copolymer, poly[(t-butyl methacrylate)-(methyl methacrylate)-(polymethacrylic acid)] copolymer, or poly[(t-butyl-5-norbornene-2-carboxylate)-(maleic anhydride)-(5-norbornene-2,3-dicarboxylic anhydride)] copolymer.--

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